1. Identification of the substance / preparation and company / undertaking

Product name	Vertron 404A	
REACH registration numbers	1,1,1-Trifluoroethane Pentafluoroethane 1,1,1,2-Tetrafluoroethane	01-2119492869-13 01-2119485636-25 01-2119459374-33
Company	Harp Middle East Co.LLC P.O.Box: 48598, Sharjah United Arab Emirates Tel: +97165344794 Fax: +97165344834 Email:harpshj@emirates.net.ae	
Emergency phone number	+97165344794	
Use	Refrigeration	

2. Hazards identification

EC Classification

EC Directive 67/548/EEC	Not classified as hazardous
Regulation (EC) No. 1272/2008 (CLP)	Gases under pressure – Liquefied gas

Label Elements

Name on label	
Hazardous components	1,1,1-Trifluoroethane (143a) Pentafluoroethane (R125) 1,1,1,2-Tetrafluoroethane (R134a)
Hazard statement(s)	H280: Contains gas under pressure; may explode if heated
Signal word(s)	Warning
Hazard pictogram(s)	
Precautionary statement(s) Storage	P410 + P403: Protect from sunlight. Store in a well-ventilated place.

3. Composition / information on ingredients

Concentration

Substance name	CAS No.	EC No.	Concentration
1,1,1-Trifluoroethane (143a)	420-46-2	206-996-5	ca. 52%
Pentafluoroethane (R125)	354-33-6	206-557-8	ca. 44%
1,1,1,2-Tetrafluoroethane (R134a)	811-97-2	212-377-0	ca. 4%

Hazardous components according to Regulation (EC) 1272/2008 as amended

Substance name	Hazard class	Hazard category	H Phrases
1,1,1-Trifluoroethane (143a)	Flammable gases	Category 1	H220
	Gases under pressure	Liquefied gas	H280
Pentafluoroethane (R125)	Gases under pressure	Liquefied gas	H280
1,1,1,2-Tetrafluoroethane (R134a)	Gases under pressure	Liquefied gas	H280

Hazardous components according to European Directive 67/548/EEC or 1999/45/EC as amended

Substance name	Classification	Hazard category	R-phrase(s)
1,1,1-Trifluoroethane (143a)	F+	Extremely flammable	R12

4. First aid measures

Inhalation Remove to fresh air. Oxygen or artificial respiration if needed. If symptoms persist, call a physician.

Skin contact Allow to evaporate. Wash off with warm water. If symptoms persist, call a physician.

Eye contact Immediately irrigate with eyewash solution or clean water, holding the eyelids apart for at least 10 minutes. Obtain immediate medical attention.

Ingestion Unlikely route of exposure.

Most important symptoms/effects, acute and delayed

Inhalation In case of higher concentrations: narcosis, asphyxia, may cause cardic arrhythmia.

Skin contact Contact with liquid or refrigerated gas can cause cold burns and frostbite. Prolonged skin contact may defat the skin and produce dermatitis.

Eye contact Causes frostbite burns to eyes. Symptoms: Lachrymation, redness, swelling of tissue, frostbite, burn.

Ingestion Gas. Not applicable.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media: As appropriate for surrounding fire. Keep fire exposed containers cool by spraying with water.

Unsuitable extinguishing media: None.

Specific hazards arising from the Chemical	The product is not flammable. Hazardous decomposition products formed under fire conditions.
Special protective actions for Fire-Fighters	Wear self-contained breathing apparatus and protective suit Wear chemical resistant oversuit Special protective actions for fire-fighters In case of fire, use water spray Keep product and empty container away from heat and sources of ignition

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel	Prevent further leakage or spillage if safe to do so Keep away from incompatible products
Advice for emergency responders	Immediately evacuate personnel to safe areas Keep people away from and upwind of spill/leak Wear self-contained breathing apparatus and protective suit Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing Suppress (knock down) gases/vapours/mists with a water spray jet Avoid spraying the leak source Ventilate area
Environmental precautions	Discharge into the environment must be avoided Inform the responsible authorities in case of gas leakage or of entry into waterways, soil or drains
Methods and materials for containment and cleaning up	Allow to evaporate Prevent product from entering drains
Reference to other sections	Refer to protective measures listed in sections 7 and 8.

7. Handling and storage

Precautions for safe handling	Use only in well-ventilated areas Use only clean and dry utensils Keep away from water Preferably transfer by pump or gravity Keep away from incompatible products

Conditions for storage, including incompatibilities

Storage	Keep only in the original container Store in a receptacle equipped with a vent Keep containers tightly closed in a cool, well-ventilated place Keep in properly labelled containers Keep in a bunded area Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep away from incompatible products
Packing material	Suitable material – steel cylinder
Specific use(s)	For further information, please contact supplier.

8. Exposure controls / personal protection

Control parameters

Exposure limit values

Substance	Acceptable exposure limit	EH40 workplace exposure limits
Pentafluoroethane	TWA = 1000 ppm	Not listed
1,1,1-Trifluoroethane	TWA = 1000 ppm	Not listed
1,1,1,2-Tetrafluoroethane	TWA = 1000 ppm	TWA = 1000 ppm / 4240 mg/m^3

Exposure controls

Appropriate engineering controls	Ensure adequate ventilation Apply technical measures to comply with the occupational exposure limits
Respiratory protection	Self-contained breathing apparatus (EN 133) Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions Use only respiratory protection that conforms to international / national standards
Hand protection	Take note of the information given by the producer concerning permeability and break through times and of special workplace conditions (mechanical strain, duration of contact). Protective gloves Suitable material: Fluoroelastomer
Eye protection	Tightly fitted safety goggles
Skin and body protection	Wear suitable protective clothing If splashes are likely to occur, wear: apron, boots, Neoprene
Hygiene measures	Eye wash bottles or eye wash stations in compliance with applicable standards When using do not eat, drink or smoke Gloves, overalls and boots have to be double layered (protection against cold temperature). Handle in accordance with good industrial hygiene and safety practice
Environmental exposure controls	Dispose of rinse water in accordance with local and national regulations.

9. Physical and chemical properties

Form	Compressed liquefied gas
Colour	Colourless
Odour	Ether-like
pH	Neutral
pKa	Not applicable
Melting point/freezing point	-103ºC (Pentafluoroethane)
Boiling point/boiling range	-46.7ºC
Flash point	Not applicable
Evaporation rate	No data
Flammability (solid, gas)	The product is not flammable
Flammability	Not applicable

Explosive properties	Not explosive
Vapour pressure	10.98 bar at 20°C 20.03 bar at 50°C
Vapour density	>3
Density	Not applicable
Bulk density	Not applicable
Solubility	430 mg/l at 25°C, water (pentafluoroethane)
Solubility/qualitative	No data available
Partition coefficient: n-octanol/water	log Pow: 1.48, 20°C (pentafluoroethane)
Auto-ignition temperature	728°C
Decomposition temperature	>700°C
Viscosity	Not applicable
Oxidizing properties	Non oxidizer

10. Stability and reactivity

Reactivity
Risk of violent reaction

Chemical stability
Stable under recommended storage conditions

Possibility of hazardous reactions
Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.
Vapours are heavier than air and may spread along floors

Conditions to avoid
Heat

Materials to avoid
Light and/or alkaline metals, powdered metals, alkaline earth metals, oxidising agents

Hazardous decomposition products
Gaseous hydrogen fluoride (HF), Fluorophosgene
The release of other hazardous decomposition products is possible

11. Toxicological information

Acute toxicity

Acute oral toxicity	Not applicable
Acute inhalation toxicity	LC50, 4 h, >2,030,000 mg/m3 (1,1,1-Trifluoroethane) LC0, 4 h, rat, >800000 ppm (Pentafluoroethane)
Acute dermal toxicity	Not relevant

Skin corrosion
Not applicable

Serious eye damage/eye irritation
Not applicable

Respiratory or skin sensitization
Not applicable

Mutagenicity
In vitro tests did not show mutagenic effects (Pentafluoroethane)
In vivo tests did not show mutagenic effects (Pentafluoroethane)

Carcinogenicity
No data available

Toxicity for reproduction
No toxicity to reproduction (Pentafluoroethane)

Repeated dose toxicity
Inhalation, after a single exposure, dog, 10% w/w, risk of cardiac sensitization at high dose (Pentafluoroethane)
Inhalation, repeated exposure, rat, >=50000ppm, NOAEL (Pentafluoroethane)

Other information
No data available

12. Ecological information

Toxicity

Fishes	Brachydanio rerio	LC50	96 h	>200 mg/l	1,1,1,3,3-pentafluorobutane
Fishes	Brachydanio rerio	LC50	96 h	Ca. 200 mg/l	1,1,1,3,3-pentafluorobutane
Fishes	Various species	LC50	96 h	109mg/l	1,1,1-Trifluoroethane
Crustaceans	Daphnia magna	EC50	48 h	>200 mg/l	1,1,1,3,3-pentafluorobutane
Crustaceans	Daphnia magna	NOEC	48 h	200 mg/l	1,1,1,3,3-pentafluorobutane
Crustaceans	Daphnia magna	EC50	48 h	300 mg/l	1,1,1-Trifluoroethane
Crustaceans	Various species	EC50	Calculated value	115 mg/l	1,1,1-Trifluoroethane
Algae	Selenastrum capricornutum	NOEC	72 h	13.2 mg/l	1,1,1,3,3-pentafluorobutane
Algae	Selenastrum capricornutum	EC50	72 h	>114 mg/l	1,1,1,3,3-pentafluorobutane
Algae	Various species	EC50	72 h	71 mg/l	1,1,1-Trifluoroethane
Terrestrial plants		NOEC	growth	>=6 g/m^3	1,1,1,3,3-pentafluorobutane

Persistence and degradability

Abiotic degradation — Air, indirect photo-oxidation. Conditions: sensitizer: OH radicals. Degradation products**:** carbon dioxide (CO2) / hydrofluoric acid
Water. Result: non-significant hydrolysis

Biodegradation — Aerobic, tested according to closed bottle test, degradation, 5% after 28 d. Result: not readily biodegradable (Pentafluoroethane)

Bioaccumulative potential — Bioaccumulative potential: log Pow 1.48. Result: does not bioaccumulate (Pentafluoroethane)

Mobility — Soil/sediments, adsorption, log KOC: from 1.3 – 2.3. Conditions: calculated value
Air, Henry's law constant (H), from 65 – 185 kPa.m^3/mol, 20^{o}C. Conditions: calculated value, considerable volatility

Other adverse effects — Ozone depletion potential = 0
Result = no effect on stratospheric ozone
Ozone depletion potential; ODP; (R11 = 1) (Pentafluoroethane)
Global Warming Potential = 0.94
Halocarbon global warming potential; HGWP; (R11 = 1)

13.Disposal considerations

Waste disposal methods — In accordance with local and national regulations
Refer to manufacturer/supplier for information on recovery/recycling

Contaminated packaging — To avoid treatments, as far as possible, use dedicated containers

14.Transport information

International transport regulations

IATA-DGR

UN number	UN 3337
Class	2.2
ICAO-Labels	2.2 - Non-flammable, non-toxic gas
Proper shipping name	Vertron 404A

IMDG

UN number	UN 3337
Class	2.2
IMDG-Labels	2.2 - Non-flammable, non-toxic gas
HI/UN No.	3337
EmS	F-C, S-V
Proper shipping name	REFRIGERANT GAS R404A

ADR

UN number	UN 3337
Class	2
ADR/RID Labels	2.2 - Non-flammable, non-toxic gas
HI/UN No.	20 / 3337
Proper shipping name	REFRIGERANT GAS R404A

RID

UN number	UN 3337
Class	2
ADR/RID Labels	2.2 - Non-flammable, non-toxic gas
HI/UN No.	20 / 3337
Proper shipping name	REFRIGERANT GAS R404A

ADN

UN number	UN 3337
Class	2
ADR/RID Labels	2.2 – Non-flammable, non-toxic gas
Proper shipping name	REFRIGERANT GAS R404A

15. Regulatory information

Applicable Laws or Regulations

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as amended
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations, as amended
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, as amended
- Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste
- EH40/2005 Workplace Exposure Limits, as amended through 1, 10, 2007 (WEL's) published by the Health and Safety Executive (HSE). Issued under the Control of Substances Hazardous to Health Regulations, as amended

Notification status

Inventory information	Status
Australian Inventory of Chemical Substances (AICS)	In compliance with inventory
Canadian Domestic Substances List (DSL)	In compliance with inventory
Inventory of Existing Chemical Substances (China) (IECS)	In compliance with inventory
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	In compliance with inventory
New Zealand Inventory of Chemicals (NZIOC)	In compliance with inventory
Toxic Substance Control Act List (TSCA)	In compliance with inventory
EU List of Existing Chemical Substances (EINECS)	In compliance with inventory
Korean Existing Chemicals Inventory (KECI (KR))	In compliance with inventory
Philippine Inventory of Chemicals and Chemical Substances (PICCS)	In compliance with inventory

16. Other information

Full text of H-Statements referred to under section 3

H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

Full test of R-phrases referred to under sections 2 and 3

R12	Extremely flammable

This datasheet was prepared in accordance with Regulation (EC) No. 1907/2006.

The information supplied in this Safety Data Sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication however no guarantee is made to its accuracy. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.
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